IN THE CLAIMS:

Please AMEND the claims and ADD new claims as indicated below:

1. (CURRENTLY AMENDED) A method comprising:

inputting a signal light to an optical regenerator;

shaping a waveform of ~~an input~~the input signal light by the optical regenerator to thereby ~~produce~~ output a shaped ~~output~~ signal light; and

~~selecting a quality measure that obtains a quality measurement of said output signal light from one of:~~

~~a Q factor;~~

~~a bit error rate;~~

~~a spectrum shape; and~~

~~an eye opening; and~~

controlling ~~the~~ a power level of ~~said input~~the signal light input to the optical regenerator so that ~~said~~ a quality measurement of the signal light output by the optical regenerator is improved, the quality measurement being one of a Q factor, a bit error rate, a spectrum shape and an eye opening ~~to an optimal level~~.

2. (CURRENTLY AMENDED) A method according to claim 1, wherein said controlling comprises

optically amplifying the signal light with an optical amplifier before being input to the optical regenerator, and~~providing an optical amplifier amplifying said input signal light, and~~

adjusting ~~the~~ gain of ~~said~~ the optical amplifier to thereby control the power level of the signal light input to the optical regenerator.

7. (CURRENTLY AMENDED) A device comprising:

an ~~a waveform shaper~~optical regenerator inputting a signal light and shaping a waveform of ~~an~~ the input signal light to thereby ~~produce~~ output a shaped ~~output~~ signal light; and

~~a quality selection module that obtains a quality measurement of said output signal light from one of:~~

~~a Q factor;~~

~~a bit error rate;~~

~~a spectrum shape; and~~

~~an eye opening; and~~

a power controller controlling ~~the~~ a power level of ~~said input~~the signal light before the signal light is input to the optical regenerator so that ~~said~~ a quality measurement of the signal light output by the optical regenerator is improved, ~~to an optimal level~~the quality measurement being one of a Q factor, a bit error rate, a spectrum shape and an eye opening.

8. (CURRENTLY AMENDED) A device according to claim 7, wherein said power controller comprises an optical amplifier amplifying ~~said input~~the signal light before being input to the optical regenerator, and a controller adjusting ~~the~~ gain of ~~said~~ the optical amplifier ~~so that said quality measurement~~ to thereby control the power level of the signal light~~is most improved to the optimal level~~.

9. (CURRENTLY AMENDED) A device according to claim 7, wherein said power controller comprises an optical amplifier amplifying ~~said input~~the signal light before being input to the optical regenerator, an optical attenuator attenuating the amplified signal light before being input to the optical regenerator~~an output from said optical amplifier~~, and a controller adjusting ~~the~~ attenuation of ~~said~~ the optical attenuator ~~so that said quality measurement is most improved to the optimal level~~ to thereby control the power level of the signal light.

10. (CURRENTLY AMENDED) A method comprising:

providing ~~a waveform shaper~~an optical regenerator having a variable threshold for waveform shaping input signal light according to said variable threshold and thereby outputting waveform ~~output~~ shaped signal light;

measuring ~~the~~ quality of said output signal light; and

controlling said variable threshold in accordance with the measured quality so that ~~said~~ the measured quality ~~measure~~ is improved.

11. (WITHDRAWN - CURRENTLY AMENDED) A method according to claim 10, wherein:

said ~~waveform shaper~~optical regenerator comprises a semiconductor optical amplifier; and

said controlling ~~step~~ comprises ~~the step of~~ adjusting an injection current to be supplied to said semiconductor optical amplifier.

12. (WITHDRAWN - CURRENTLY AMENDED) A method according to claim 10, wherein:

said ~~waveform shaper~~optical regenerator comprises a distributed feedback laser diode adapted to change said variable threshold according to the power of assist light supplied thereto; and

said controlling ~~step~~ comprises ~~the step of~~ adjusting the power of said assist light.

13. (CURRENTLY AMENDED) A device comprising:

an optical regenerator~~a waveform shaper~~ having a variable threshold for waveform shaping input signal light according to said variable threshold and outputting output signal light;

means for measuring the quality of said output signal light; and

a controller ~~for~~ controlling said variable threshold in accordance with the measured quality so that ~~said~~ the measured quality ~~measured~~ is improved.

14. (WITHDRAWN - CURRENTLY AMENDED) A device according to claim 13, wherein:

said ~~waveform shaper~~optical regenerator comprises a semiconductor optical amplifier; and

said controller adjusts an injection current to be supplied to said semiconductor optical amplifier.

15. (WITHDRAWN - CURRENTLY AMENDED) A device according to claim 13, wherein:

said ~~waveform shaper~~optical regenerator comprises a distributed feedback laser diode adapted to change said variable threshold according to the power of assist light supplied thereto, and a light source for outputting said assist light; and

said controller adjusts the power of said assist light.

16. (CURRENTLY AMENDED) The method of claim 1, wherein the ~~input~~ signal light is a wavelength division multiplexed signal.

17. (CURRENTLY AMENDED) A method comprising:

inputting signal light to an optical regenerator;

shaping a waveform of ~~an input~~the input signal light by the optical regenerator to thereby ~~produce~~ output a shaped ~~output~~ signal light;

measuring a Q factor of said output signal light; and

controlling ~~the~~ a power level of ~~said input~~the signal light input to the optical regenerator in accordance with the measured Q factor to ~~optimize~~ improve the measured Q factor.

18. (CURRENTLY AMENDED) A method comprising:

inputting a signal light to an optical regenerator;

shaping a waveform of ~~an input~~the input signal light by the optical regenerator to thereby ~~produce~~ output a shaped ~~output~~ signal light;

measuring a bit error rate of said output signal light; and

controlling ~~the~~ a power level of ~~said~~ the input signal light in accordance with the measured bit error rate to ~~optimize~~ improve the measured bit error rate.

19. (CURRENTLY AMENDED) A method comprising:

inputting signal light to an optical regenerator;

shaping a waveform of ~~an~~ the input signal light by the optical regenerator to thereby ~~produce~~ output a shaped ~~output~~ signal light;

measuring a spectrum shape of said output signal light; and

controlling the power of said input signal light in accordance with the measured spectrum shape to ~~optimize~~ improve the measured spectrum shape.

20. (CURRENTLY AMENDED) A method comprising:

inputting a signal light to an optical regenerator;

shaping of waveform of the input signal light by the optical regenerator to thereby ~~producing~~ output a shaped ~~output~~ signal ~~from an input signal~~light;

measuring an eye opening of said output signal light; and

controlling ~~the~~ a power level of said input signal light in accordance with the measured eye opening to ~~optimize~~ improve the measured eye opening.

21. (CURRENTLY AMENDED) An optical repeater comprising:

an amplifier that amplifies a first signal to produce a second signal;

an attenuator that attenuates the second signal to produce a third signal;

an optical regenerator that shapes a waveform of the third signal to produce a fourth signal;

a quality monitor that measures a quality of the fourth signal; and

a controller that controls the attenuator to change a power level of the second signal in accordance with the measured quality ~~and~~ to thereby ~~optimize~~ improve the measured quality of the fourth signal, wherein the first, second, third and fourth signals are optical signals.

22. (CURRENTLY AMENDED) A device comprising:

means for amplifying a first signal to produce a second signal;

means for attenuating the second signal to produce a third signal;

means for shaping a waveform of the third signal by an optical regenerator to produce a fourth signal;

means for monitoring a quality of the fourth signal; and

means for controlling the attenuation by said means for attenuating in accordance with the monitored quality to change a power level of the second signal and thereby ~~optimize~~ improve the monitored quality ~~measure~~ of the fourth signal, wherein the first, second, third and fourth signals are optical signals.

23. (CURRENTLY AMENDED) An apparatus comprising:

an optical regenerator~~means for~~ inputting a signal light and shaping a waveform of ~~an~~ the input signal light to thereby output ~~produce~~ a shaped ~~output~~ signal light;

means for measuring a Q factor of said output signal light; and

means for controlling ~~the~~ a power level of said input signal light in accordance with the measured Q factor to ~~optimize~~ improve the measured Q factor.

24. (CURRENTLY AMENDED) An apparatus comprising:

an optical regenerator inputting a signal light and~~means for~~ shaping a waveform of ~~an~~ the input signal light to thereby ~~produce~~ output a shaped ~~output~~ signal light;

means for measuring a bit error rate of said output signal light; and

means for controlling ~~the~~ a power level of said input signal light in accordance with the

measured bit error rate to ~~optimize~~ improve the measured bit error rate.

25. (CURRENTLY AMENDED) An apparatus~~A method~~ comprising:

an optical regenerator inputting a signal light and~~means for~~ shaping a waveform of ~~an~~ the input signal light to thereby ~~produce~~ output a shaped ~~output~~ signal light;

means for measuring a spectrum shape of said output signal light; and

means for controlling ~~the~~ a power level of said input signal light in accordance with the measured spectrum shape to ~~optimize~~ improve the measured spectrum shape.

26. (CURRENTLY AMENDED) An apparatus~~A method~~ comprising:

an optical regenerator inputting a signal light and shaping a waveform of the input signal light to thereby output~~means for producing~~ a shaped ~~output~~ signal light ~~from an input signal light~~;

means for measuring an eye opening of said output signal light; and

means for controlling ~~the~~ a power level of said input signal light in accordance with the measured eye opening to ~~optimize~~ improve the measured eye opening.

27. (CURRENTLY AMENDED) A method as in claim 1, wherein said controlling comprises:

controlling gain of an optical amplifier which amplifies the input signal light, to thereby control the power level of the input signal light.

28. (CURRENTLY AMENDED) A method as in claim 17, wherein said controlling comprises:

controlling gain of an optical amplifier which amplifies the input signal light, to thereby control the power level of the input signal light.

29. (CURRENTLY AMENDED) A method as in claim 18, wherein said controlling comprises:

controlling gain of an optical amplifier which amplifies the input signal light, to thereby control the power level of the input signal light.

30. (CURRENTLY AMENDED) A method as in claim 19, wherein said controlling comprises:

controlling gain of an optical amplifier which amplifies the input signal light, to thereby control the power level of the input signal light.

31. (CURRENTLY AMENDED) A method as in claim 20, wherein said controlling comprises:

controlling gain of an optical amplifier which amplifies the input signal light, to thereby control the power level of the input signal light.

32. (NEW) A method according to claim 1, wherein the optical regenerator is one of an interference type optical regenerator and a nonlinear optical loop mirror (NOLM) optical regenerator.

33. (NEW) A device according to claim 7, wherein the optical regenerator is one of an interference type optical regenerator and a nonlinear optical loop mirror (NOLM) optical regenerator.

34. (NEW) A method according to claim 17, wherein the optical regenerator is one of an interference type optical regenerator and a nonlinear optical loop mirror (NOLM) optical regenerator.

35. (NEW) A method according to claim 18, wherein the optical regenerator is one of an interference type optical regenerator and a nonlinear optical loop mirror (NOLM) optical regenerator.

36 (NEW) A method according to claim 19, wherein the optical regenerator is one of an interference type optical regenerator and a nonlinear optical loop mirror (NOLM) optical regenerator.

37. (NEW) A method according to claim 20, wherein the optical regenerator is one of an interference type optical regenerator and a nonlinear optical loop mirror (NOLM) optical regenerator.

38. (NEW) An optical repeater according to claim 21, wherein the optical

regenerator is one of an interference type optical regenerator and a nonlinear optical loop mirror (NOLM) optical regenerator.

39. (NEW) A device according to claim 22, wherein the optical regenerator is one of an interference type optical regenerator and a nonlinear optical loop mirror (NOLM) optical regenerator.

40. (NEW) An apparatus according to claim 23, wherein the optical regenerator is one of an interference type optical regenerator and a nonlinear optical loop mirror (NOLM) optical regenerator.

41. (NEW) An apparatus according to claim 24, wherein the optical regenerator is one of an interference type optical regenerator and a nonlinear optical loop mirror (NOLM) optical regenerator.

42. (NEW) An apparatus according to claim 25, wherein the optical regenerator is one of an interference type optical regenerator and a nonlinear optical loop mirror (NOLM) optical regenerator.

43. (NEW) An apparatus according to claim 26, wherein the optical regenerator is one of an interference type optical regenerator and a nonlinear optical loop mirror (NOLM) optical regenerator.